



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 5**  
**9311 GROH ROAD**  
**GROSSE ILE, MI 48138**

**MEMORANDUM**

**SUBJECT:** Development of an Indoor Dust Screening Criteria for the USS Lead Site

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The Integrated Exposure Uptake Biokinetic (IEUBK) model used by the US Environmental Protection Agency (USEPA) uses the concentration of indoor dust as a key parameter to evaluate risks to children from lead in soil. EPA separates dust into fine (<150  $\mu\text{m}$ ) and coarse (>150  $\mu\text{m}$ ) fractions. It has been shown that the fine particle size is the fraction that is most likely to adhere to children's hands and be ingested. In addition, more recent information also indicates that there is a potential for enrichment of lead in smaller sized particles and increased bioavailability (USEPA 2016). Using only the fine particle size concentration for screening can improve the accuracy of exposure and risk calculations in lead risk assessments.

The IEUBK model (version 1.1 Build 11) was used to determine an indoor dust screening level for lead. The default assumption in the model is that the concentration of lead in indoor dust is 70% of the concentration of lead in outdoor soil (Brattin and Griffin - 2011). US EPA recommends that lead concentrations in residential soil do not exceed 400 parts per million (ppm) in soil.

The modeling was performed using default inputs from the IEUBK model for diet, drinking water, air concentration and bioavailability. The IEUBK model was run using 400 ppm for lead in soil and modeled children 0 to 84 months of age. The calculated screening level to protect this population from a current US EPA acceptable blood lead level of 10  $\mu\text{g/dL}$  is **316 ppm** of lead in

dust. This concentration should be used when evaluating the fine particle size fraction of lead dust contamination.

## REFERENCES

Brattin and Griffin - 2011 - William Brittin, Susan Griffin. Evaluation of the Contribution of Lead in Soil to Lead in Dust at Superfund Sites. Human and Ecological Risk Assessment: An International journal Vol. 17, Iss. 1, 2011.

USEPA 2016 - OLEM Directive 9200.1-128. Recommendations for Sieving Soil and Dust Samples at Lead Sites for Assessment of Incidental Ingestion.